

Our ref: 24-054.01L

Sam Buswell
Countryside Partnerships
Vistry Group (West Yorkshire)
1 Red Hall Avenue
Paragon Business Village
Wakefield
WF1 2UL

22nd March 2024

Dear Sam,



Arc Environmental Ltd
Solum House
Unit 1 Elliott Court
St Johns Road
Meadowfield
Durham
DH7 8PN

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU

1.0 Introduction: -

Arc Environmental Limited (ARC) were commissioned by Countryside Partnerships to undertake a programme of supplementary intrusive ground investigation works to facilitate the construction of a new housing development on land at Blue Hills Farm, Birkenshaw. These supplementary intrusive works were the result of the discovery of suspected mine entries (shafts) in the south of the site during supervised excavation works by Arc Environmental Limited for contamination 'hot spot' removal and by Countryside Partnerships during drainage excavation works and suspected bell pits on the northeast of the site. The National Grid Reference for the central part of the development area is approximately 419990, 427760. The intrusive ground investigation works undertaken by ARC comprised the sinking of 22 no. rotary (open hole) boreholes (labelled RBH1, RBH1A, RBH1B, RBH2, RBH2A, RBH2B, RBH3 to RBH9, RBH101 to RBH109), 13 no. windowless sampling boreholes (labelled WS101 to WS113) and 3 no. trial trenches (TT101 to TT103). The borehole positions, along with third party rotary boreholes (labelled RO 01 to RO 06) can be seen on the Exploratory Hole Location Plan attached.

2.0 Geological Setting: -

Based on geological maps produced by the BGS the site is shown to be situated in an area where drift deposits are thin or absent i.e. area of solid outcrop. The solid geology comprises the Pennine Lower Coal Measures (PLCM) of Carboniferous age, where mudrocks (mudstone, shale or siltstone) are recorded at rockhead level below the whole of the site. An inferred geological fault traverses the site trending SW-NE with a recorded downthrow to the SE. Therefore, this assessment discusses the differing anticipated geological settings both northwest and southeast of the fault.

2.1 Northwest of the Inferred Fault: -

According to BGS map (SE12NE, 1,10,000 scale) the Wheatly Line (WL) coal seam sub-crops approximately mid-way across the site at a bearing of c.270° dipping to the north / northeast.

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2.0 Geological Setting (Cont'd): -

2.1 Northwest of the Inferred Fault (Cont'd): -

This seam has a regional thickness of $\leq 1.10\text{m}$. The next named coal seam below the Wheatly Line (WL) is the Blocking Coal (BK) with a regional thickness of 0.50m to 0.80m.

2.2 Southeast of the Inferred Fault: -

According to BGS map (SE12NE, 1,10,000 scale) the Second Brown Metal Coal (2BM) sub-crops in the approximate top third of the area at a bearing of $c.270^\circ$ dipping to the north toward the inferred fault. This seam has a regional thickness of $c.0.40\text{m}$ to 0.80m . The next named coal seam below the Second Brown Metal Coal (2BM) is the Middleton Little Coal (ML) with a regional thickness of $c.0.20\text{m}$ to 0.70m .

3.0 Site-Specific Coal Mining Information: -

In accordance with the Coal Authority Online Map Viewer, parts the site (northeast of coal outcrop positions) are shown to lie within a 'Coal Mining Reporting Area' a defined 'Development High Risk Area' and area of Probable Shallow Coal Mine Workings (See Figure 1 below).

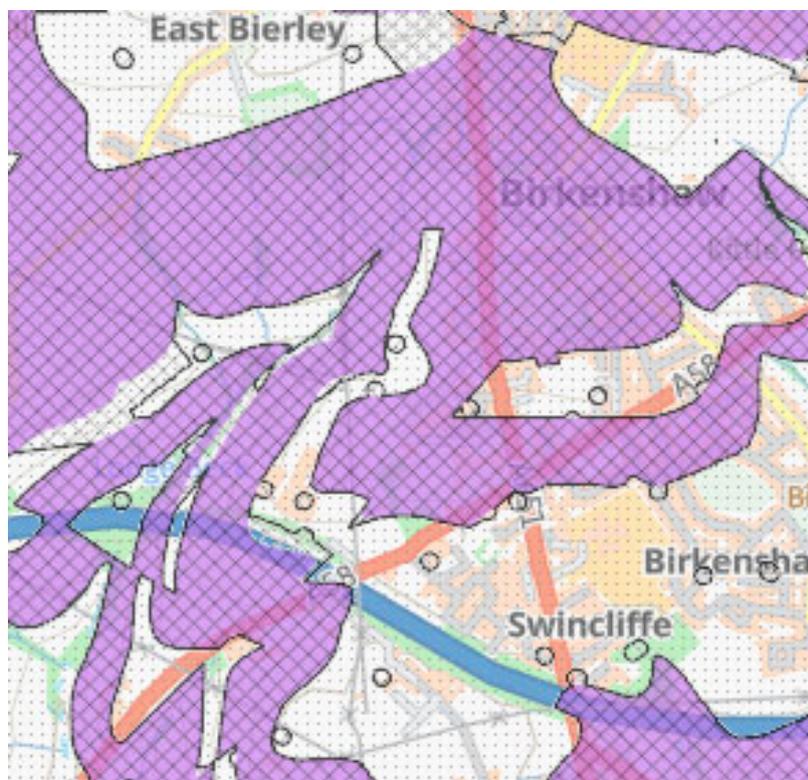


Figure 1 - Coal Authority Interactive Map Viewer Extract (Development High Risk Area & Probable Shallow Coal Mine Workings)

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

3.0 Site-Specific Coal Mining Information (Cont'd): -

For completeness, a Consultants Coal Mining Report was procured from the Coal Authority to further assess the risks posed to the site with respect to possible instability issues arising in the future as a direct result of past shallow coal mining activities.

The report concludes the Coal Authority have records relating to known workings below the site area within the Silkstone Coal seam at depths of 44m to 87m and last worked during 1886 and 1914/15 with an extraction thickness of 0.61m to 0.76m. The Coal Authority do not hold any records relating to known coal workings below the site area within any shallower named seams.

However, the Coal Authority do hold records relating to deeper coal workings within the Whinmoor and Black Bed Coals at depths of c.70m to c.144m, and c.163m to 167m respectively.

The Consultants Coal Mining Report infers probable unrecorded shallow workings below the site but no recorded spine roadways at shallow depth. There are no mine entries (shafts / adits) recorded on site (although several mine entries are recorded in proximity to the site). No opencast workings recorded on site, whilst there are no managed tips within c.500m of the site. There are no coal mining subsidence claims within c.50m of the site boundary and no mine gas occurrences within 500m of the site boundary. Finally, the named on-site sub-cropping seams north and south of the fault, recorded as the Wheatley Line (WL) and Second Brown Metal (2BM) by the BGS, are referred to as the Middleton Eleven Yards and Low Fenton respectively by the Coal Authority.

4.0 Summary of Previous Third Party Mining Related Reports

4.1 Report on Preliminary Risk Assessment and Coal Mining Risk Assessment - Ian Farmer Associates (IFA), Ref. 42251, September 2018

4.1.1 Site History: -

Extracts from reports executive summary - 'Since 1852 the site has been surrounded by numerous coal pits, collieries and shafts which remained active until 1976, when the last colliery identified as Birkenshaw Colliery closed. Since 1852 Halfway House colliery was located 50m east of the site since until 1893 when Oakroyd Hall built. The buildings remained however the Hall became occupied by WRCC Ambulance HQ IN 1957 which remained until present day. Subsequently the fire service HQ occupied the site along with the Ambulance HQ since 1976. Oakroyd Colliery formed the northwest site boundary since 1893 until 1908. Since 1908 Blue Hill Farm occupied the former colliery site. The M62 motorway and embankment was constructed in 1970 forming the west and southwestern boundary of the site.'

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

4.0 Summary of Previous Third Party Mining Related Reports (Cont'd)

4.1 Report on Preliminary Risk Assessment and Coal Mining Risk Assessment - Ian Farmer Associates (IFA), Ref. 42251, September 2018 (Cont'd)

4.1.2 Geology / Mining: -

Extracts from reports executive summary – *'Geological mapping indicates the superficial deposits to be absent beneath site. The map indicates bedrock of mudstone, siltstone and sandstone of Pennine Lower Coal Measures Formation (Westphalian A) of Carboniferous Age. The bedrock generally dips towards the southwest at low angles. Several seams outcrops northwest of the site which are likely to dip beneath the site. Seams of interest are Blocking Rider Coal and Blocking Coal and Beeston Coal. From scaling from the 1:3000 generalized vertical section on geological map indicates the Blocking Coal is within 30m of the surface. Historical boreholes within 135m of the site have not encountered coal within 16.00m. Two boreholes beyond 140m of the site indicate indicated possible workings between 5.66m and 8.10m (SE12NE373; 145m south) and SE12NE1723 (170m west) encountered coal between 15.10m and 15.70m. A Coal Authority report notes underground mining in 3 seams at shallow to 170m depth last worked in 1968. Any movement due to coal mining in these seams should have stopped. One mine entry (419427-010) recorded within or within 20m of the boundary of the site*'. * note, this is based on a previous site boundary and is now >20m from the site*

'The mine entry report and shaft data sheet indicate the treatment of the shaft is unknown. There is no record of a mine gas emission requiring action within the boundaries of the site. The site shows there has been no damage notice or claim for the site within 50m since 31st October 1994. The site is located within an area where a notice to withdraw support was given in 1951 and 1954. Based on the review of the historical maps, the geological information, and the Coal Mining Reports the site risks from historic coal mining are considered to be moderate'.

4.2 Ground Investigation Report - IFA, Ref. 2330244, March 2021

Extracts from reports executive summary – *'Bedrock of mudstone and sandstone was proved to 30m in rotary boreholes. **Coal seams or evidence of historic coal mining was not encountered.** Based on the coal seams and the fault the site area has been subdivided into four zones referenced A to D, clockwise from north. Zone A and Zone B are located on the northern and eastern site areas. The possibility of small-scale historic coal workings to exploit seams at shallow depths below these zones cannot be eliminated. A low risk from historic coal workings is considered appropriate. When preparing Zone A and Zone B for development the topsoil and made ground should be stripped and a watching brief by a suitably experienced professional maintained for any evidence of unrecorded historic mine entries. Zone C and Zone D are not considered to be at risk from historic coal workings'.*

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

4.0 Summary of Previous Third Party Mining Related Reports (Cont'd)

4.2 Ground Investigation Report - IFA, Ref. 2330244, March 2021 (Cont'd)



Figures 2 & 3– Extract from IFA Ground Investigation Report (Coal Risk Features & Exploratory Hole Location Plan)

When comparing Figure 2 with Figure 3 the rotary boreholes labelled RO 02, RO04 and RO 06 all appear to be positioned south of the inferred fault line with no coal seams or evidence of historic coal / ironstone mining both sides of the fault.

4.3 Archaeological Geophysical Survey - AOC Archaeology Group, Ref. 40314, February 2022

Extract from Report (Non-Technical Summary) – ‘AOC Archaeology Group was commissioned by CFA Archaeology, on behalf of their client Vistry Partnerships Yorkshire, to undertake an archaeological geophysical gradiometer survey on 25th and 28th of January 2022 to investigate the potential for buried archaeological remains at Blue Hills Farm, Birkenshaw’.

‘The results of the survey can be summarised as follows: Possible former open mine workings (bell-pits) were identified in the north-eastern corner of the survey area. These are associated with anomalies suggestive of building remains or rubble. Further concentrations of building remains, or rubble were identified at the north western corner and the southern corner of the survey area. In the western side of the survey area, anomalies were detected that have been interpreted as a former tramway or railway. These anomalies are all likely associated with the colliery and iron stone mine noted on historical maps immediately to the north and west of the survey area, operating in the late 19th century, though if present the bell pits may be earlier’.

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

4.0 Summary of Previous Third Party Mining Related Reports (Cont'd)

4.3 Archaeological Geophysical Survey - AOC Archaeology Group, Ref. 40314, February 2022 (Cont'd)

Extract from Report (Archaeological Background - Post medieval – Industrial Period (AD 1540 – 1901)) – *'Industrial activity was established in the area during the 18th and 19th centuries, notably following the construction of a blast furnace and attendant foundry by J.&W. Emmett and Co. in 1781 (WYHER 6475). This was potentially located on or around the area that contains Furnace Lane, which sits to the northern end of Navigation Bank, a linear earthwork which once held a tramway or canal. The WYHER states that when operational ironstone was supplied from adits to the north of Whitehall Road, which is the location of the site. According to J.A. Heginbottom (1995) the location of these adits is 'marked by related spoil fans which are still extant'; this could be referring to the earthworks found in the survey area. Ore from these mines was then transported to the furnace by means of the canal or tramway that followed Navigation Bank. The first edition Ordnance Survey map, from 1893, shows Oakroyd Colliery as being located just outside the north-western boundary of the survey area. However, this colliery does not appear on the 1908 Ordnance Survey map, suggesting it had a short life'.*



Figure 4 - Interpretation of Gradiometer Survey Results (Extract from Report)

Key –

- A1** The strength of these anomalies suggests an industrial origin, and their form is indicative of bell pits or other similar open-work mining activity.
- A2-A5** Characteristic of magnetic material (metals or highly fired building materials like bricks) remains within the shallow sub-surface (**A2-A5**). A group of such anomalies occurs in association with the possible bell-pits identified above, though the character of the response is somewhat more disturbed, implying that the below-ground material is also disturbed, or perhaps dumped or used as a fill for the pits (**A2**). It is also possible some of these anomalies are from further extraction pits, but their identification is less secure due to the overlapping and strong anomalies.
- A3** Area containing the earthworks and the farm buildings occupying the former colliery site west and north of the survey area (**A3**). These may relate to more intact building remains such as foundations or floors, or other structures, as discussed below.
- A4** Interpreted as former structures with strongly magnetic components such as ferrous metals or bricks.
- A5** Tentatively interpreted as the remains of a rail- or tramway associated with the mine workings
- A6-A8** Possible ditches / field boundaries

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

5.0 Investigation Rationale: -

The intrusive ground investigation works undertaken by ARC were designed to investigate the ground conditions and mining legacy features including suspected mine entries (shafts & bell pits) and shallow mine workings. The rationale behind the location of each intrusive investigation position is summarised in Table 1 below.

Table 1

Potential issue	Position
Investigate two suspected mine entries (shafts) and confirm depths	RBH1 & RBH2
Determine the risks posed to the site from shallow unrecorded mine workings.	RBH1A, RBH1B, RBH2A, RBH2B, RBH3 to RBH9
Investigate the depth and nature of the backfill ground conditions across the area of suspected bell pits	RBH101 to RBH109, WS101 to WS113 and TT101 to TT103
Determine the fault line location	RBH1A, RBH6, RBH7, RBH8 and previous IFA rotary boreholes (labelled RO 01 to RO 06)

6.0 Ground Conditions: -

For an accurate description of the ground conditions encountered at each exploratory location, reference should be made to the borehole record sheets attached. It should be noted that there is always the possibility of variation in the ground conditions around and between the exploratory locations.

6.1 South of Fault: -

6.1.1 Suspected Mine Entries (Shafts): -

Rotary Boreholes RBH1 and RBH2 targeted the two suspected boreholes (SHAFT A & SHAFT B) in the southwest of the site which were noted to be c.10.50m (SHAFT A) and c.13.00m deep (SHAFT B) respectively.

- RBH1 recorded c.10.50m of clay and ash backfill materials with no evidence of significant voiding (i.e., water flush maintained throughout) then intact light grey mudstone to at least 15.00m.
- RBH2 recorded c.13.00m of made ground comprising clay with brick and mudstone fragment to c.6.50m after which there was loss of flush with 'soft drilling' to c.10.50m then broken ground with small voids to c.13.00m which is considered to be the base of the shaft. 'Steady drilling' was then noted to at least 16.00m.

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

6.0 Ground Conditions (Cont'd): -

6.1 South of Fault (Cont'd): -

6.1.2 Shallow Mine workings: -

Additional boreholes (RBH1A, RBH1B, RBH2A and RBH2B) were positioned close to the shaft locations to check for shallow mine workings.

- Borehole RBH1A positioned just north of SHAFT A recorded clay residual soil to c.5.00m then mudstone to at least 15.00m with no evidence of coal / ironstone or workings.
- Borehole RBH1B positioned just south of SHAFT A recorded clay residual soil to c.5.00m, mudstone to c.8.70m then broken ground to c.10.50m (c.1.80m thick) with a loss of water flush then 'steady drilling' thereafter to 15.00m.
- Borehole RBH2A positioned just south of SHAFT B recorded clay residual soil to c.6.00m, mudstone to c.9.70m then broken ground to c.12.20m (c.2.50m thick) with a loss of water flush then 'steady drilling' thereafter to 16.00m.
- Borehole RBH2B positioned just south of SHAFT B recorded clay residual soil to c.6.20m, mudstone to c.9.90m then broken ground to c.12.30m (c.2.40m thick) with a loss of water flush then 'steady drilling' thereafter to 15.00m.

Following these findings further rotary boreholes were positioned across the southern portion of the site (South of the inferred fault to check for further shallow mine workings).

- Borehole RBH3 recorded clay residual soil to c.1.60m, thin coal to c.1.90m, clay / seat earth to 2.00m, mudstone to c.10.60m then broken ground to c.12.00m (c.1.40m thick) with a loss of water flush then 'steady drilling' thereafter to 15.00m.
- Borehole RBH4 recorded reworked clay to c.3.00m, clay residual soil to c.4.50m, mudstone to c.9.00m then broken ground to c.11.00m (c.2.00m thick) with a loss of water flush then 'steady drilling' thereafter to 15.00m.
- Borehole RBH5 recorded reworked clay to c.2.50m, clay residual soil to c.4.50m, mudstone to c.10.60m then broken ground to c.11.50m (c.0.90m thick) with a loss of water flush then 'steady drilling' thereafter to 15.00m.

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

6.0 Ground Conditions (Cont'd): -

6.1 South of Fault (Cont'd): -

6.1.2 Shallow Mine workings (Cont'd): -

RBH6 to RBH8 were positioned on a higher terrace (~7m higher) and recorded the following:

- Borehole RBH6 recorded reworked clay to c.2.80m, clay residual soil to c.5.20m then mudstone to at least 11.50m, sandstone to c.15.00m, then mudstone to at least 22.00m with no evidence of coal / ironstone or workings.
- Borehole RBH7 recorded reworked clay to c.2.00m, clay residual soil to c.4.00m, mudstone to c.10.00m, sandstone to c.16.50m, mudstone to c.17.20m then broken ground to c.18.70m (c.1.50m thick) with a loss of water flush then 'steady drilling' thereafter to 22.00m.
- Borehole RBH8 recorded reworked clay to c.0.40m, clay residual soil with a thin coal seam (Second Brown Metal? - 0.30m thick) to c.3.60m, mudstone to c.13.50m, sandstone to c.16.30m, mudstone to c.17.30m then broken ground to c.18.20m (c.0.90m thick) with a loss of water flush then 'steady drilling' thereafter to 22.00m.
- Borehole RBH9 recorded road stone and clay residual soil to c.1.50m then mudstone to at least 15.00m with no evidence of coal / ironstone or workings.

No gas levels were detected during the ground gas monitoring frequency undertaken during the creation of the boreholes and upon completion.

Boreholes RBH1A and RBH6 which did not encounter evidence of coal / ironstone or workings are considered to be a result of the geological fault possibly being further south than inferred.

Borehole RBH9, positioned south of RBH7 & RBH8 where evidence of working was noted, is considered anomalous at this stage, but does not discount the possibility of workings nearby given the geological setting.

6.2 North of Fault (Bell Pit Area): -

The third-party Archaeological / Geophysical survey including archaeological trenches recorded suspected bell pits / circular filled features in the northeast of the site. Following a partial site strip for Countryside Partnerships 16 no. suspected bell pits (labelled BP01 to BP16) were exposed / identified and these were surveyed using GNSS equipment by Arc Environmental.

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

6.0 Ground Conditions (Cont'd): -

6.2 North of Fault (Bell Pit Area) (Cont'd): -

To investigate the size, depth and nature of the bell pits a series of site investigation works were undertaken. In total 9 no. rotary open hole boreholes using water flush and 13 no. windowless sampling boreholes and 3 no. mechanically excavated trial trenches were sunk inside and close to the exposed bell pits.

Rotary boreholes RBH101, RBH103, RBH105 & RBH107, and windowless sampling boreholes WS101 to WS105 and WS107 to WS112 were all positioned inside the visible bell pit features and recorded c.3.20m to c.7.40m of made ground / backfill which was predominantly firm clay (locally soft, locally stiff) with pockets of mudstone, coal and burnt shale. There was no evidence of voiding within the backfill materials.

Rotary boreholes RBH102, RBH104, RBH106, RBH108, RBH109, and windowless sampling boreholes WS106 and WS113 were all positioned outside the visible bell pit features to record the ground conditions outside the workings. Except for borehole WS106, which appears to have caught the side of a bell pit, the natural deposits typically comprised clay residual soils to c.1.50m to c.5.00m over mudstone. A seam of 'poor quality' banded shaley coal with a thickness ranging from c.0.40m to c.1.10m was noted at 7 no. locations at depths of c.0.40m to c.3.20m, suggesting the bell pits were excavated to recover an alternative commodity most likely ironstone.

3 no. mechanically excavated trial trenches were attempted through selected bell pits but were terminated at shallow depths due to significant water ingress and trench instability.



Plates 1 to 3 – Photographic Records of Trial Trenches TT101, TT102 & TT103

No gas levels were detected during the ground gas monitoring frequency undertaken during the creation of the boreholes and upon completion.

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

7.0 Groundwater: -

Significant water ingress was noted inside the backfilled bell pits (trial trenches and windowless sampling boreholes) from c.1.00m to c.2.00m bgl.

The rotary boreholes all used water flush so any water ingress could not be determined.

8.0 Conclusions & Recommendations: -

In terms of coal mining risk assessments, the basic principle which underpins the process is that within Development High Risk Areas including shafts and areas of shallow mine workings there are existing ground stability risks from mining legacy hazards and that new development proposals need to assess and mitigate these risks in the interests of public safety.

The area south of the fault is underlain by 2 no. unrecorded shafts and mine workings (broken ground) at shallow depths i.e., c.141.58mAOD to c.145.73mAOD (base of shafts / workings is c.140.25mAOD to c.143.80mAOD) anticipated within the Middleton Little coal seam but possibly relating to an ironstone band.

Given the ground conditions identified, the risk of ground movement (crown hole failure) occurring at the surface anytime in the foreseeable future cannot be ruled out or dismissed.

The two shafts recorded below a proposed Carlow Tank and proposed highway (estate road) and shallow workings should be fully consolidated by drilling and grouting which would fully dismiss the risk of future ground instability in these workings. Similarly, the effected highway and 32 no. housing plots south of or straddling the revised fault line will require treatment including plots with traditional and piled foundations. This report should be passed on to a specialist drilling and grouting contractor to design and price a suitable scheme. Any treatment scheme will need to be agreed with Kirklees planning & highways departments, the Coal Authority (under permit), and the warranty providers.

A flexible type gabion retaining wall founded on a stone sub-base is planned in the area of shallow mine workings and specialist advice should be sought from drilling and grouting contractors to check whether this element of construction will also require treatment.

Following the bell pit investigations where boreholes / trenches were undertaken these features appear to have been adequately backfilled with typically firm clays with no evidence of voids or significant deleterious materials. As such it may be possible to support new dwellings in this area using piled foundations and suspended floor slabs with piles taken beyond the base of the bell pits which were noted to be up to c.7.40m deep. Confirmation should be sought from the appointed specialist drilling and grouting contractor with regards any minimum pre-treatment requirements of bell pits before piling (if any).

Re: Land at Blue Hills Farm, Whitehall Road West, Birkenshaw, Bradford, Kirklees, BD11 2DU (Cont'd)

8.0 Conclusions & Recommendations: -

Given the northeast of the site was not fully stripped at the time of the investigation there is high a risk of further unrecorded historical bell pitting and a 'watching brief' is recommended during further site strip / ground preparation works both in the northeast and site wide to check for circular features which could represent potential mine entries and require remedial works or piled foundations.

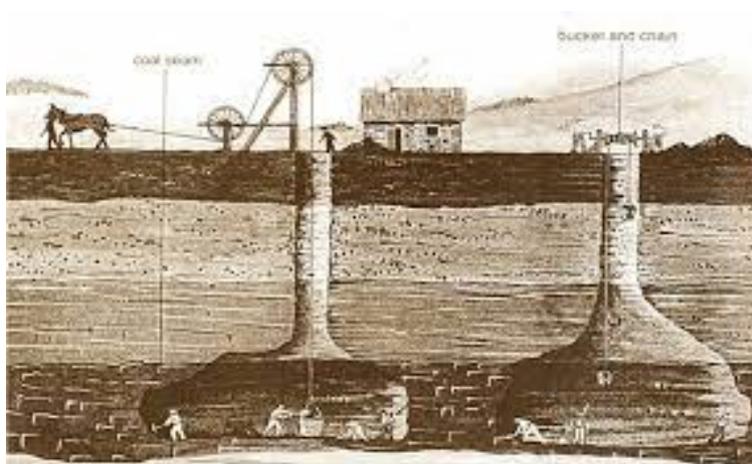


Figure 5 - Typical example of historical bell pitting for illustration purposes

We trust the contents of this report are to your satisfaction, and if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely

REDACTED

For and on behalf of Arc Environmental Ltd
John Ditchburn BEng (Hons) CSci MIEEnvSc MCIEH FGS
Director



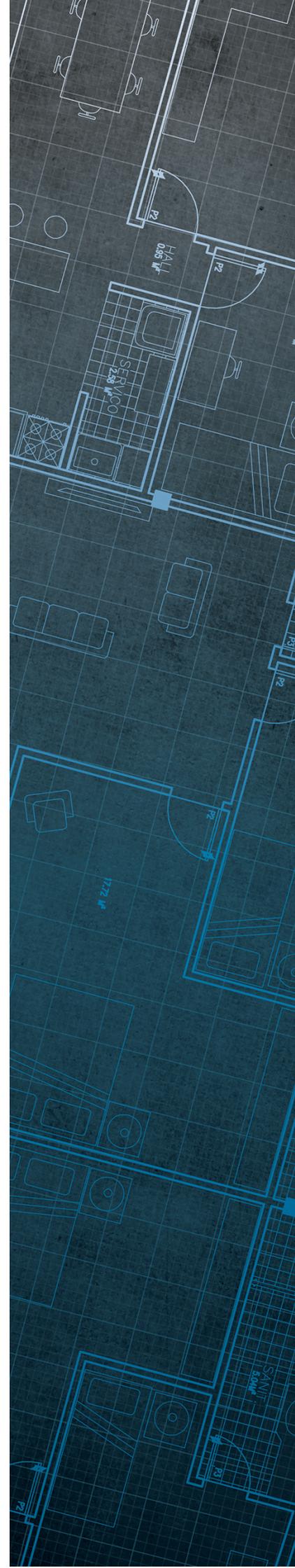
The Coal
Authority

Consultants Coal Mining Report

Land At Blue Hills Farm
Whitehall Road West
Birkenshaw
Bradford
Kirklees
BD11 2DU

Date of enquiry: 11 March 2024
Date enquiry received: 11 March 2024
Issue date: 11 March 2024

Our reference: 51003410757001
Your reference: 24-054



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Arc Environmental Limited

Enquiry address

Land At Blue Hills Farm
Whitehall Road West
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Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	SILKSTONE	Coal	6H9X	44	Beneath Property	1.2	South-East	71	1886
unnamed	SILKSTONE	Coal	6Z1D	50	Beneath Property	1.1	South-East	61	1886
unnamed	WHINMOOR	Coal	6H9Z	70	Beneath Property	1.4	South	66	1903
unnamed	WHINMOOR	Coal	6HA1	75	Beneath Property	1.4	South	56	1915
unnamed	SILKSTONE	Coal	6H9W	85	Beneath Property	1.6	East	76	1914
unnamed	WHINMOOR	Coal	6Z1H	87	Beneath Property	0.5	South	56	1916
unnamed	SILKSTONE	Coal	6Z1E	87	Beneath Property	2.0	North-East	70	1915
unnamed	WHINMOOR	Coal	6H9Y	137	South	0.6	South	66	1968
unnamed	WHINMOOR	Coal	6Z1I	144	South-East	1.2	North	71	1967
unnamed	BLACK BED	Coal	6HA4	163	North-West	1.9	East	182	1893
unnamed	BLACK BED	Coal	6O1X	165	North	1.9	East	170	1881
unnamed	BLACK BED	Coal	6HO7	167	North	1.9	East	170	1892

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	419427-004	419823 427795		Coal	
Shaft	419427-010	419826 427708		Coal	
Shaft	419427-014	419911 427969		Coal	
Shaft	420427-008	420093 427879		Coal	
Shaft	420427-015	420125 427647		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

FGB336	M262	2764
FGB667	2275	M49
FGB335	PO0	GCR216

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
LOW FENTON	Coal	Yes	Within	N/A	267
MIDDLE ELEVEN YARDS	Coal	Yes	Within	N/A	270

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Faults under or close to the property recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

Distance to site investigation (m)	Direction
3.1	North-East
20.1	South-West
Within	N/A

See Section 4 for further information.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is in an area where notices to withdraw support were given in 1951 and 1954.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

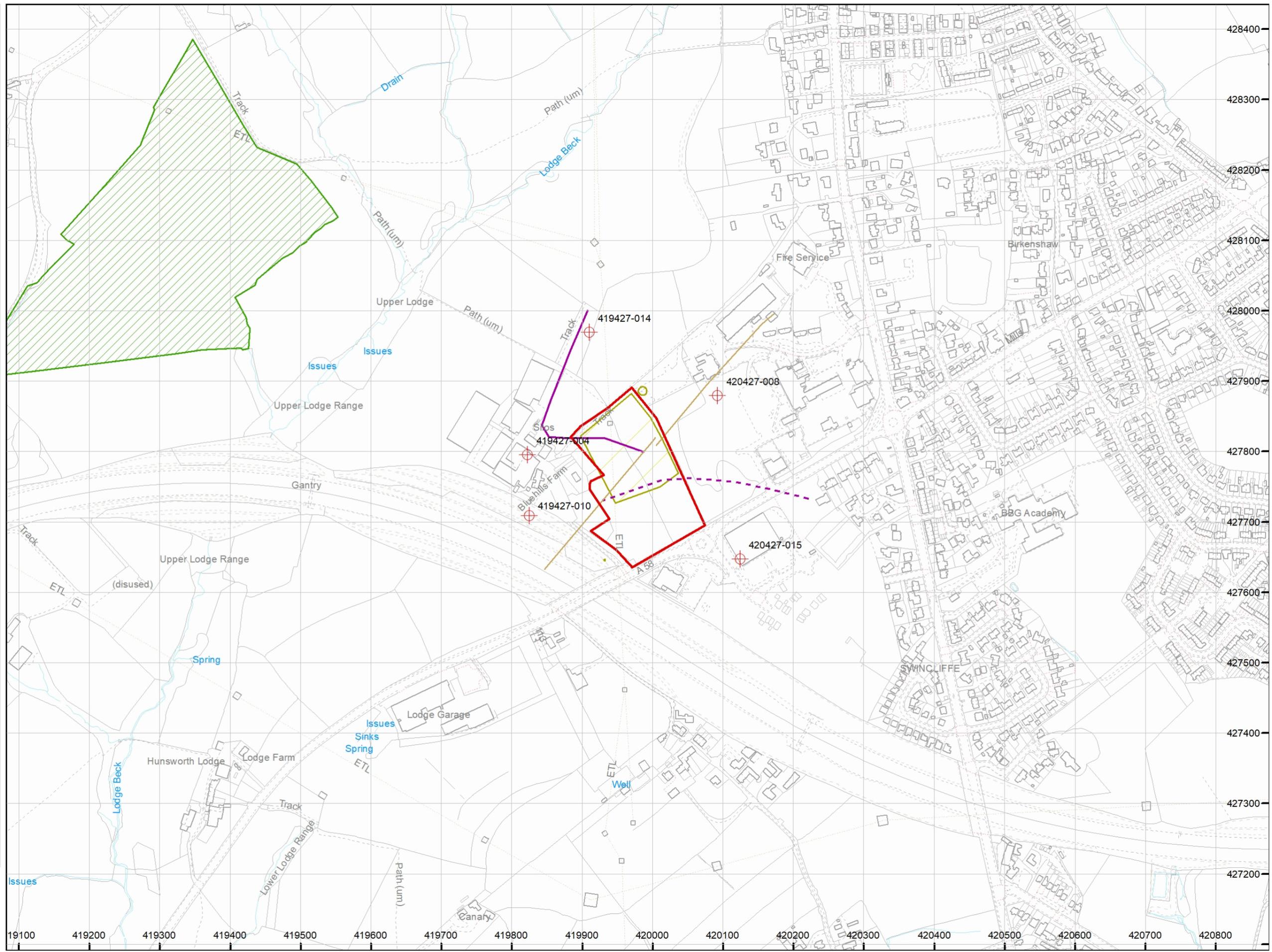
Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 
- Outcrop (Proven) 
- Outcrop (Conjectured) 
- Geological faults 
- Unlicensed opencast site 
- Site investigations 



How to contact us
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SE12NE 374 1993-2763

Works: *West Riding C.C. M62 Contract 6* Borehole no. *634*
 Contractor: *Wm. Coulson Ltd.* Sheet no. *1 of 1*
 Site: *Bluehills Bridge* Chainage *925.90*
 Cut/ (ft) *Motorway in 44'0" cut* Offset from C/L (ft.) *113 North*
 Type of boring *Rotary* B.H. Level (O.D.) *494.00*
 Lining Tubes *not used* Date(s) of boring *7.10.9.11.14*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
						OPEN HOLE.
5-50	10'-0"			10'-0"	484.00	
		5%				Fragments of :- Yellow fine grained SANDSTONE. Dark grey MUDSTONE. With grey to brown CLAY. (POSSIBLE FILL.)
	19'-0"					
		5%				
	23'-6"			23'-6"	470.5	
						Grey to dark grey MUDSTONE with plant remains, fractured, brown stained in places.
		70%				
	31'-0"			31'-0"	463.00	
						Borehole Completed.
Remarks (Observations on ground water, etc) <i>No water encountered.</i>						

C219

SE12NE 373 1993-2762

Works: *West Riding C.C. M62 Contract G* Borehole no. *X.521*
 Contractor: *Spil. Mechanics Ltd.* Sheet no. *1 of 2*
 Site: *Bluehills Bridge* Chainage *92530*
 Cut/Off (ft) *Motorway to A.R. cut* Offset from C/L (ft) *119 North*
 Type of boring *Rotary* B.M. Level (O.D.) *489.0 (estimated)*
 Date(s) of boring *24-4 to 1-5-64*
 Lining Tubes *to 26'-0"*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
						OPEN HOLE.
	5'-0"		X	5'-0"	484.0	Stiff mottled grey and brown silty CLAY.
			X	8'-0"	481.0	
	10'-0"					Light brown fine grained SANDSTONE, fractured.
	15'-0"			17'-0"	470.0	
			X	18'-6"	468.5	Grey silty MUDSTONE.
	20'-0"		X X			Grey silty CLAY with fragments of MUDSTONE and SANDSTONE (Possible OLD WORKINGS.)
	23'-0"					
	26'-0"		X	26'-6"	462.5	Silty MUDSTONE, carbonaceous with occasional coaly traces and with plant remains, fractured.
			X	29'-6"	459.5	
	31'-0"		X			Grey, very silty MUDSTONE, fairly massive.
	36'-0"		X			
	40'-0"		X			Borehole Continued.
Remarks (Observations on ground water, etc) EDITED FROM PRELIMINARY LOG.						
Water first encountered at 23'-0".						

C219

SE12NE 373

Works: *West Riding C.C. M62 Contract G* Borehole no. *X 521*
 Contractor: *Soil Mechanics Ltd* Sheet no. *2 of 2*
 Site: *Blue Hills Bridge* Chainage *92530*
 Cut (H) *Motorway in 40' cut* Offset from C/L (ft) *110 North*
 Type of boring B.M. Level (O.D.) *489.0 (estimated)*
 Lining Tubes to *28'-0"* Date(s) of boring *24-4 to 1-5-64*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
	41'-0"		X			Grey, very silty MUDSTONE, fairly massive.
	46'-0"		X	45'-0"	444.0	
	51'-0"		X X			Grey sandy SILTSTONE, some ironstone bands.
	54'-6"		X	55'-0"	434.0	
	58'-6"		X			Grey silty MUDSTONE, fairly massive.
	61'-0"		X			
	65'-6"		X			
	70'-0"		X	70'-0"	419.0	Borehole Completed.

Remarks (Observations on ground water, etc)

SE12NE 378 1993-2759

Works: *West Riding C.C. M 62 Contract G* Borehole no. *G 37*
 Contractor: *Wm Coulson Ltd.* Sheet no. *1 of 2*
 Site: *Bluehills Bridge* Chainage *925 82*
 Cut (ft) *Motorway in 30-0" cut* Offset from C/L (ft.) *47 North*
 Type of boring *Rotary Air to 75-0"* B.H. Level (O.D.) *480.00*
 Lining Tubes *not used* Date(s) of boring *10/12-11-66*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
						OPEN HOLE.
5-50	11'-0"			11'-0"	469.00	
		85%	X			Grey SILTSTONE with plant remains, fractured, brown stained in places.
	19'-0"		X X	19'-0"	461.00	
		100%	X			Grey SILTSTONE, brown stained in places, with occasional bands of IRONSTONE and SANDSTONE, partly fragmented, becoming progressively more massive with depth.
	26'-0"		X X			
		100%	X			
	35'-0"		X			
		100%	X			
			X			Borehole Continued.
Remarks (Observations on ground water, etc)						
Water encountered at 28'-0" on 12-11-66.						

SE12NE 378

Works: *West Riding C.C. M62 Contract G* Borehole no. *G 37*
 Contractor: *Wm. Coulson Ltd.* Sheet no. *2 of 2*
 Site: *Bluehills Bridge* Chainage *925 82*
 Cut (ft) *Motorway in 30'-0" cut* Offset from C/L (ft) *47 North*
 Type of boring *Rotary Air to 75'-0"* B.M. Level (O.D.) *480.00*
 Lining Tubes *not used* Date(s) of boring *10 / 12 - 11 - 66*

Samples & Core Recovery. Change of Strata						
No.	Depth	Type or %	Key	Depth	Level	Description of Strata
	44'-0"	100%	X			<i>Grey SILTSTONE, brown stained in places, with occasional bands of IRONSTONE and SANDSTONE, partly fragmented, becoming progressively more massive with depth.</i>
			X			
		100%	X			
			X X			
	53'-0"		X			
		100%	X			
			X			
	63'-0"		X			
		100%	X			
			X			
	73'-0"		X X			
	75'-0"	100%	X	75'-0"	405.00	
						<i>Borehole Completed.</i>
Remarks (Observations on ground water, etc)						

C219

Investigation Works Key

	Surveyed position of former BELL PIT as exposed during initial site strip works		Surveyed trial trench position
	Surveyed rotary borehole position		Previous surveyed rotary borehole completed by others (IAN FARMERS ASSOCIATES)
	Surveyed windowless sampling borehole		Hatching denotes a series of proposed house plots, a portion of the access road and the base of the proposed carlow tank across the SOUTHERN portion of site where remedial works (grouting) will be required prior to construction works to stabilise former workings at shallow depth
	Incorrect portion of historically recorded FAULT and COAL SEAM position		

Sub-crop of the WHEATLEY LINE (WL) Coal Seam as transposed from the Coal Authority (CA) Consultants Mining Report (ref: 51003410757001). The arrow denotes the recorded dip direction of the seam. The conjectured position of the coal sub-crop has been revised based on findings within the exploratory hole positions completed on site

Conjectured REVISED sub-crop position of the WHEATLEY LINE (WL) Coal Seam based on findings within various phases of rotary borehole works across the site area

Note: Across the northern site area and zone of former BELL PIT features, a piled foundation solution is felt to be the most appropriate foundation option when considering the variable and geotechnically 'poor' backfill materials recorded within these historic mining features. A watching brief is recommended during any future ground preparation / site strip works across this area of site to determine whether further as yet uncovered features are present which would adversely impact the proposed development

Position of fault as transposed from the Coal Authority (CA) Consultants Mining Report (ref: 51003410757001) with the downthrow to SOUTH. This fault route has been marked with crosses for the purposes of this drawing, as the actual position of the fault is felt to lie further to the south, based on findings within the rotary boreholes completed on site

Conjectured line of fault based on findings within ARC ENVIRONMENTAL LTD boreholes completed in February 2024. This is primarily based on variations in ground conditions within boreholes carried out in the south-western portion of site. Within RBH1A, intact drilling was noted with no broken ground or loss of flush recorded. Within rotary borehole RBH1, deep backfill likely associated with a former mine entry / shaft was recorded and within rotary borehole RBH1B broken ground and loss of flush at depth was recorded. This confirms that the line of the fault is likely present at some point between these borehole positions. Broken ground and loss of flush was also recorded within rotary borehole RBH08 completed near the eastern site boundary suggesting the fault line across this area of site is northwards of this rotary borehole position

No evidence of broken ground / loss of flush / voids within previous borehole RO 06

Portion of the sub-crop within the 2BM Coal Seam recorded within the CA Consultants Report felt to be incorrect, based on findings within rotary boreholes. The position of the FAULT on site is felt to be further south than previously recorded and therefore the portion of the coal seam sub-crop marked by crosses is not present across this area of site

Conjectured position of the sub-crop of the SECOND BROWN METAL (2BM) Coal Seam as transposed from the Coal Authority (CA) Consultants Mining Report (ref: 51003410757001). The exact position of the sub-crop is unknown however it appears to tie-in with the historically recorded coal seam sub-crop position when considering that a thin coal seam was recorded at shallow depth within rotary borehole RBH08 between 1.40-1.70m bgl which is felt to be representative of the 2BM coal seam. The arrow denotes the recorded dip direction of the seam

Rotary Borehole Works to Target Fault and Shallow Coal Workings

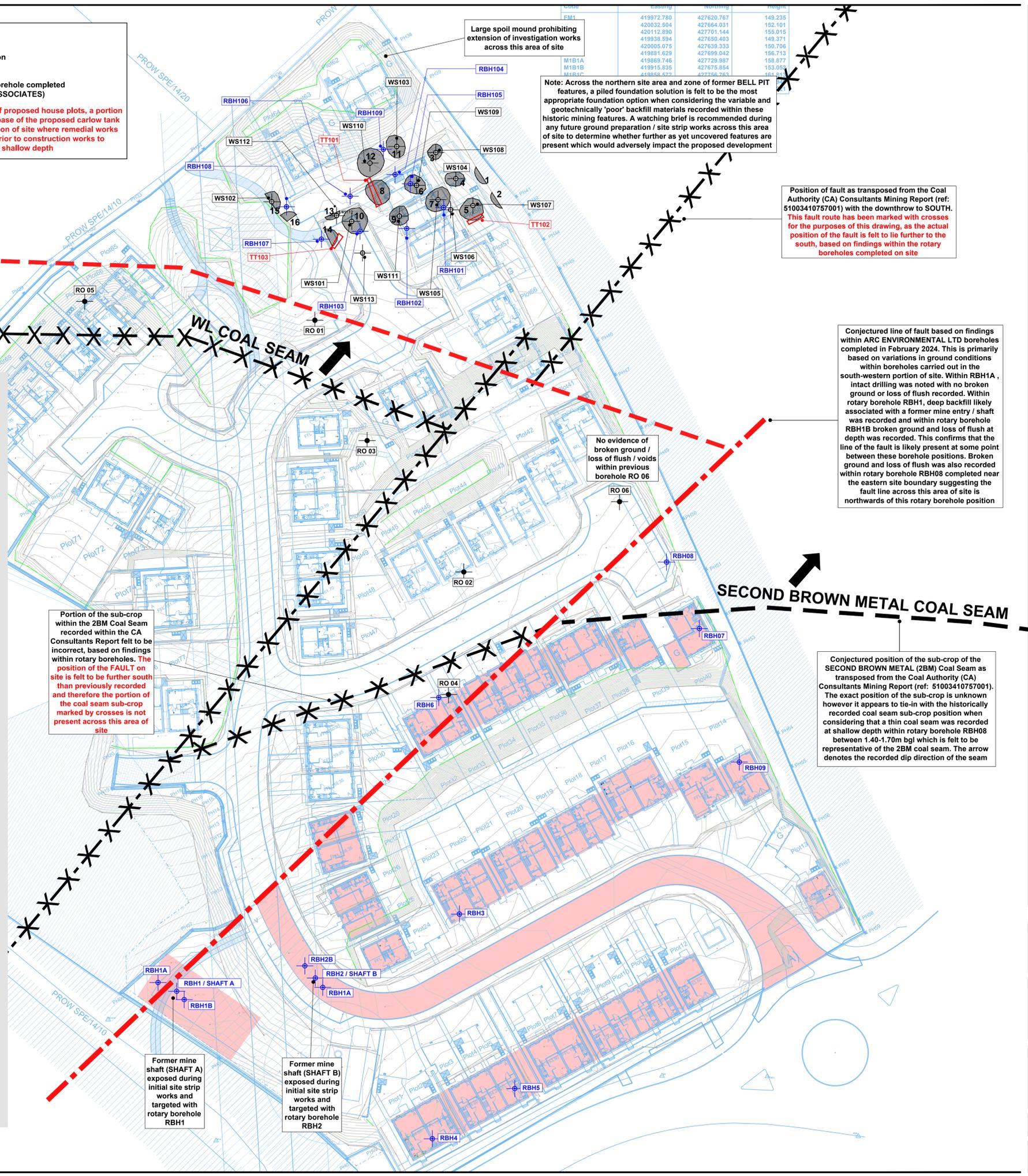
Investigation Position	Surveyed investigation position level (m AOD)	Depth of broken ground / loss of flush / voids (m BGL)	Other details
RBH1	154.30	-	Drilled at location of SHAFT A - 10.50m of made ground recorded from ground level
RBH1A	154.43	N/A	N/A
RBH1B	154.30	8.70 - 10.50	-
RBH2	155.39	-	Drilled at location of SHAFT B - 13.00m of made ground recorded from ground level. Loss of flush / broken ground / voids noted between 6.50 - 13.00mm bgl
RBH2A	155.43	9.70 - 12.20	Loss of flush (LoF) / Broken Ground (BG) / Small Voids (SV)
RBH2B	155.45	9.90 - 12.30	LoF / BG / SV
RBH3	154.25	10.60 - 12.00	LoF / BG / SV
RBH4	153.75	9.00 - 11.00	LoF / BG / SV
RBH5	153.46	10.60 - 11.50	LoF / BG / SV
RBH6	160.32	N/A	N/A
RBH7	158.95	16.50 - 17.20	LoF / BG / SV
RBH8	158.88	17.30 - 18.20	LoF / BG / SV
RBH9	154.28	N/A	N/A

Rotary Borehole Works to Target Area of Former Bell Pits

Investigation Position	Surveyed investigation position level (m AOD)	Depth of Made Ground / Backfill (m BGL)	Other details
RBH101	167.81	6.00	Targeting Bell Pit BP7
RBH102	167.96	None recorded	Refer to nearby window sample boreholes (see below) for accurate ground conditions
RBH103	167.39	4.50	Targeting Bell Pit BP10
RBH104	168.24	None recorded	Refer to nearby window sample boreholes (see below) for accurate ground conditions
RBH105	168.19	5.50	Positioned between bell pit features
RBH106	168.37	None recorded	Refer to nearby window sample boreholes (see below) for accurate ground conditions
RBH107	167.95	6.00	To target the western edge of bell pit BP14
RBH108	168.60	None recorded	Refer to nearby window sample boreholes (see below) for accurate ground conditions
RBH109	169.99	None recorded	Refer to nearby window sample boreholes (see below) for accurate ground conditions

Windowless Sampling Borehole Works to Target Area of Former Bell Pits

Investigation Position	Surveyed Investigation Position Level (m AOD)	Depth of Made Ground / Backfill (m BGL)	Other Details
WS101	167.52	5.40	Targeting Bell Pit BP10
WS102	196.16	7.40	Targeting Bell Pit BP15
WS103	169.85	5.30	Targeting Bell Pit BP11
WS104	169.03	3.20	Targeting Bell Pit BP4
WS105	167.95	4.65	Targeting Bell Pit BP7
WS106	167.95	3.30	Positioned between BP5 and BP7
WS107	168.73	6.40	Targeting Bell Pit BP5
WS108	169.24	6.40	Targeting Bell Pit BP3
WS109	168.25	5.60	Targeting Bell Pit BP6
WS110	169.26	6.00	Targeting Bell Pit BP12
WS111	167.93	5.60	Targeting Bell Pit BP9
WS112	167.68	3.40	Targeting Bell Pit BP13
WS113	167.29	None encountered	Positioned to the SOUTH of site Bell Pit BP10



Former mine shaft (SHAFT A) exposed during initial site strip works and targeted with rotary borehole RBH1

Former mine shaft (SHAFT B) exposed during initial site strip works and targeted with rotary borehole RBH2

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The contractor shall check all dimensions on site prior to commencement of works. No dimensions to be scaled off this drawing
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rev.	date	amendments	drawn	checked

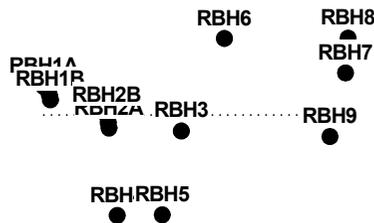
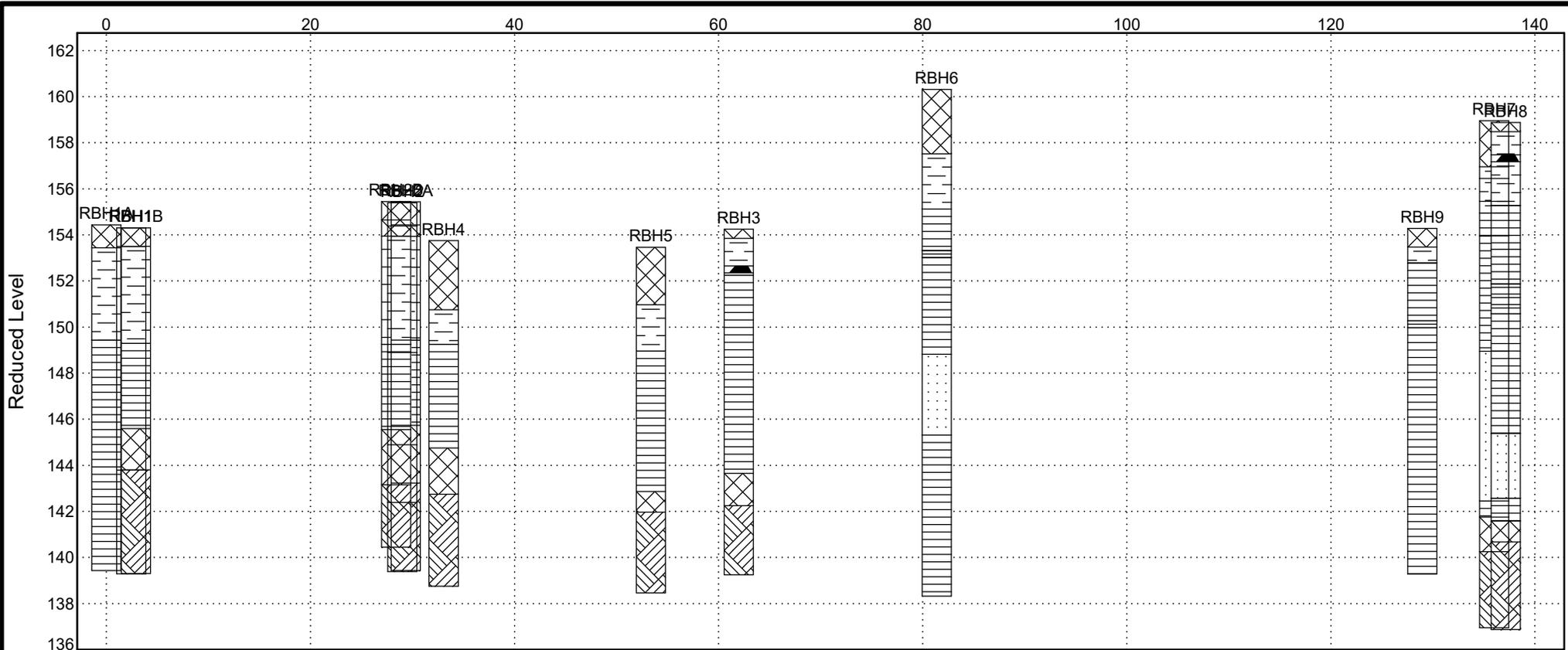
Client: **COUNTRYSIDE PARTNERSHIPS / VISTRY GROUP (WEST YORKSHIRE)**

Project Title: Land at Blue Hills
 Whitehall Road West, Birkenshaw
 Bradford, Kirklees, BD11 2DU

Drawing Title: Exploratory Hole Location Plan

Scale at A1: NTS @ A1 | Date: 13.03.24 | Drawn by: P.D. | Approved by: J.P.D.

Job Ref: 24-054 | Dwg no: - | Rev: -



Arc Environmental Ltd
 Solum House, Unit 1 Elliott Court, Durham
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SUBSURFACE SECTION

Client: Countryside Partnerships
 Project: Land at Blue Hills Farm, Birkenshaw
 Number: 24-054



Arc Environmental Ltd
 Solum House, Unit 1 Elliott Court, Durham
 DH7 8PN
 Telephone: 0191 378 6380

DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH1	
Job No 24-054	Date 26-02-24	Ground Level (m) 154.30	Co-Ordinates () E 419,930.3 N 427,681.8		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities			Detail
			153.50	[Cross-hatch pattern]	(0.80) 0.80		Imported road stone (MADE GROUND) (Drillers description)		
				[Cross-hatch pattern]	(9.70)		Clay with ash (MADE GROUND / BACKFILLED SHAFT) (Drillers description)		
			143.80	[Cross-hatch pattern]	10.50		Light grey MUDSTONE (Drillers description)		
				[Horizontal lines pattern]	(4.50)				
			139.30	[Horizontal lines pattern]	15.00				

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
							0	15	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH1A	
Job No 24-054	Date 26-02-24	Ground Level (m) 154.43	Co-Ordinates () E 419,926.4 N 427,683.7		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities			Detail	Main
			153.43		(1.00) 1.00		Imported road stone (MADE GROUND) (Drillers description)			
					(4.00)		Brown and grey CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))			
			149.43		5.00					
					(10.00)		Light grey MUDSTONE with brown SANDSTONE bands (PENNINE LOWER COAL MEASURES)			
			139.43		15.00					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	15	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH1B	
Job No 24-054	Date 27-02-24	Ground Level (m) 154.30	Co-Ordinates () E 419,931.9 N 427,680.1		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities	Detail	Main
			153.50	(0.80)	0.80		Imported road stone (MADE GROUND) (Drillers description)	
				(4.20)			Brown and grey CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)	
			149.30		5.00		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	
				(3.70)				
			145.60		8.70		BROKEN GROUND WITH SMALL VOIDS - LOSS OF WATER FLUSH (Drillers description) (PENNINE LOWER COAL MEASURES)	
			143.80		10.50		STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)	
				(4.50)				
			139.30		15.00			

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	8.7	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
							8.7	15	WATER	0	

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH2	
Job No 24-054	Date 01-03-24	Ground Level (m) 155.39	Co-Ordinates () E 419,959.5 N 427,684.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities	Detail	Main
			154.39	(1.00)	1.00		Imported road stone (MADE GROUND) (Drillers description)	
				(5.50)			Light brown clay with brick and mudstone fragments (MADE GROUND / BACKFILLED SHAFT) (Drillers description)	
			148.89	(4.00)	6.50		SOFT DRILLING - LOSS OF WATER FLUSH (MADE GROUND / BACKFILLED SHAFT) (Drillers description)	
			144.89	(2.50)	10.50		BROKEN GROUND WITH SMALL VOIDS - NO WATER FLUSH RETURNS (MADE GROUND / BACKFILLED SHAFT) (Drillers description)	
			142.39	(3.00)	13.00		STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	6.5	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
							6.5	16	WATER	0	

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH2	
Job No 24-054	Date 01-03-24	Ground Level (m) 155.39	Co-Ordinates () E 419,959.5 N 427,684.6		
Contractor Arc Environmental Limited				Sheet 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail			Main
			139.39		16.00					

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH2A	
Job No 24-054	Date 01-03-24	Ground Level (m) 155.43	Co-Ordinates () E 419,961.1 N 427,682.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
			154.43	(1.00)	1.00			Imported road stone (MADE GROUND) (Drillers description)		
			153.93	(1.50)	1.50			Reworked clay (MADE GROUND) (Drillers description)		
				(4.50)	6.00			Light brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES)		
			149.43	(3.70)	9.70			Light grey MUDSTONE (PENNINE LOWER COAL MEASURES)		
			145.73	(2.50)	12.20			BROKEN GROUND WITH SMALL VOIDS - LOSS OF WATER FLUSH (Drillers description) (PENNINE LOWER COAL MEASURES)		
			143.23	(3.80)				STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)		

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	9.7	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
							9.7	16	WATER	0	
All dimensions in metres Scale 1:93.75			Client	Countryside Partnerships			Method/ Plant Used	Rotary			Logged By DT

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH2A	
Job No 24-054	Date 01-03-24	Ground Level (m) 155.43	Co-Ordinates () E 419,961.1 N 427,682.6		
Contractor Arc Environmental Limited				Sheet 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail			Main
			139.43		16.00					

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH2B	
Job No 24-054	Date 01-03-24	Ground Level (m) 155.45	Co-Ordinates () E 419,957.3 N 427,687.2		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities	Detail	Main
			154.65	(0.80)	0.80		Imported road stone (MADE GROUND) (Drillers description)	
			153.95	(1.50)	1.50		Reworked clay (MADE GROUND) (Drillers description)	
			149.25	(4.70)	6.20		Light brown CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)	
			145.55	(3.70)	9.90		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	
			143.15	(2.40)	12.30		BROKEN GROUND WITH SMALL VOIDS - NO WATER FLUSH RETURNS (MADE GROUND / BACKFILLED SHAFT) (Drillers description)	
			140.45	(2.70)	15.00		STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
							0	9.9	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
							9.9	12.3	WATER	0	

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH3	
Job No 24-054	Date 04-03-24	Ground Level (m) 154.25	Co-Ordinates () E 419,989.8 N 427,698.0		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION		
					Discontinuities	Detail	Main	
			153.85	X	0.40		Reworked clay (MADE GROUND) (Drillers description)	
				-	(1.20)		Light brown CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)	
			152.65		1.60			
			152.35	■	1.90		Black COAL (Drillers description) (PENNINE LOWER COAL MEASURES)	
			152.25		2.00		Light brown CLAY (SEATEARTH) (Drillers description) (PENNINE LOWER COAL MEASURES)	
					(8.60)		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	
			143.65	X	10.60			
				X	(1.40)		BROKEN GROUND WITH SMALL VOIDS - NO WATER FLUSH RETURNS (MADE GROUND / BACKFILLED SHAFT) (Drillers description)	
			142.25	X	12.00			
				X	(3.00)		STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)	
			139.25	X	15.00			

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
							0	10.6	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
							10.6	15	WATER	0	

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH4	
Job No 24-054	Date 04-03-24	Ground Level (m) 153.75	Co-Ordinates () E 419,984.1 N 427,650.8		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION				
						Discontinuities	Detail			Main
			150.75	(3.00)	3.00			Reworked clay (MADE GROUND) (Drillers description)		
			149.25	(1.50)	4.50			Light brown CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			144.75	(4.50)	9.00			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			142.75	(2.00)	11.00			BROKEN GROUND WITH SMALL VOIDS - LOSS OF WATER FLUSH (Drillers description) (PENNINE LOWER COAL MEASURES)		
			138.75	(4.00)	15.00			STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	9	WATER	100	
							9	15	WATER	0	

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH6	
Job No 24-054	Date 05-03-24	Ground Level (m) 160.32	Co-Ordinates () E 419,985.5 N 427,743.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
			157.52	(2.80)	2.80		(2.80)	Reworked clay (MADE GROUND) (Drillers description)		
			155.12	(2.40)	5.20		(2.40)	Light brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))		
			153.32	(1.80)	7.00		(1.80)	Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			153.02	(4.20)	7.30		(4.20)	Dark grey shaley MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			148.82	(3.50)	11.50		(3.50)	Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			145.32	(3.50)	15.00		(3.50)	Light brown SANDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS		
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns			
							0	22	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.		
All dimensions in metres Scale 1:93.75							Client		Countryside Partnerships			Method/ Plant Used	Rotary

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH6	
Job No 24-054	Date 05-03-24	Ground Level (m) 160.32	Co-Ordinates () E 419,985.5 N 427,743.6		
Contractor Arc Environmental Limited				Sheet 2	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail			Main
			138.32		(7.00)					
					22.00					

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.

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All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH7	
Job No 24-054	Date 06-03-24	Ground Level (m) 158.95	Co-Ordinates () E 420,040.4 N 427,758.1		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
				(2.00)	2.00			Reworked clay (MADE GROUND) (Drillers description)		
			156.95		2.00					
			156.45		2.50			Light brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))		
				(1.00)	3.50			Dark grey / blkck shaley CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))		
			155.45		3.50					
			154.95		4.00					
				(1.00)	5.00			Light brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))		
			153.95		5.00			Light brown weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
				(5.00)				Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			148.95		10.00					
				(6.50)				Light grey SANDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	17.2	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH7	
Job No 24-054	Date 06-03-24	Ground Level (m) 158.95	Co-Ordinates () E 420,040.4 N 427,758.1		
Contractor Arc Environmental Limited				Sheet 2	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			
						Discontinuities			Detail
			142.45		16.50		Light grey SANDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES) <i>(continued)</i>		
			141.75		17.20		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			140.25		(1.50) 18.70		BROKEN GROUND WITH SMALL VOIDS - LOSS OF WATER FLUSH (Drillers description) (PENNINE LOWER COAL MEASURES)		
			136.95		(3.30) 22.00		STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							17.2	22	WATER	0	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH8	
Job No 24-054	Date 06-03-24	Ground Level (m) 158.88	Co-Ordinates () E 420,033.5 N 427,772.0		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			158.48	X	0.40				
				(1.00)					
			157.48		1.40				
			157.18	■	1.70				
				(1.90)					
			155.28		3.60				
				(1.90)					
			153.38		5.50				
				(1.50)					
			151.88		7.00				
				(1.30)					
			150.58		8.30				
				(5.20)					
			145.38		13.50				
				(2.80)					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
							0	17.3	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH8	
Job No 24-054	Date 06-03-24	Ground Level (m) 158.88	Co-Ordinates () E 420,033.5 N 427,772.0		
Contractor Arc Environmental Limited				Sheet 2	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
			142.58		16.30			Light grey SANDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES) <i>(continued)</i>		
			141.58		(1.00) 17.30			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			140.68		(0.90) 18.20			BROKEN GROUND / SOFT DRILLING - LOSS OF WATER FLUSH (Drillers description) (PENNINE LOWER COAL MEASURES)		
			136.88		(3.80) 22.00			STEADY DRILLING / INTACT ROCK - NO WATER FLUSH RETURNS (Drillers description) (PENNINE LOWER COAL MEASURES)		

of 2

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS		
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns			
							17.3	22	WATER	0	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.		
All dimensions in metres Scale 1:93.75							Client		Countryside Partnerships			Method/ Plant Used	Rotary

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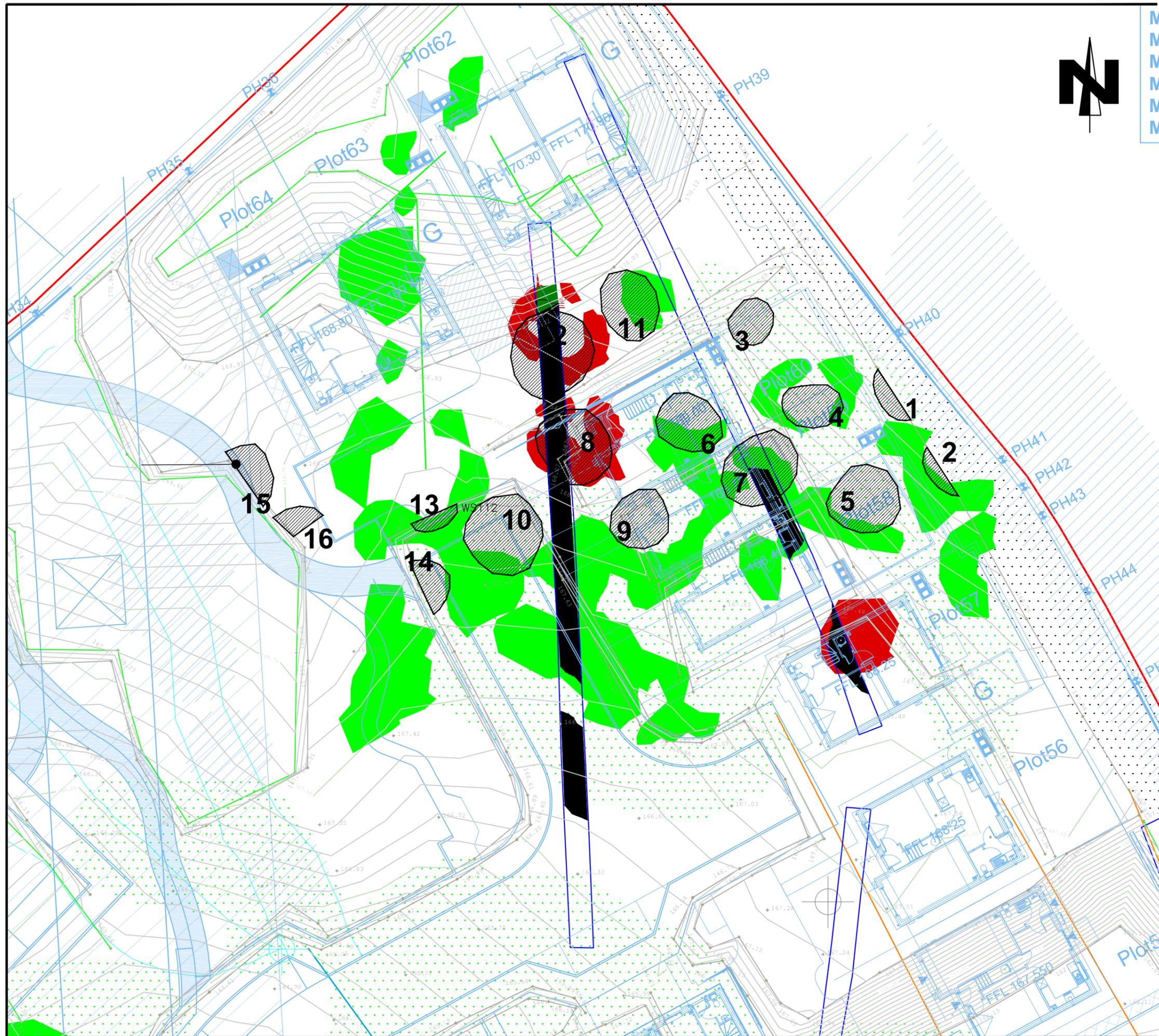
DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH9	
Job No 24-054	Date 06-03-24	Ground Level (m) 154.28	Co-Ordinates () E 420,048.8 N 427,730.0		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						Discontinuities	Detail	Main
			153.48	[Cross-hatch pattern]	(0.80) 0.80		Imported road stone (MADE GROUND) (Drillers description)	
			152.78	[Horizontal lines]	1.50		Light brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))	
				[Vertical lines]	(2.50)		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	
			150.28	[Horizontal lines]	4.00			
			149.98	[Horizontal lines]	4.30		Black SHALE (Drillers description) (PENNINE LOWER COAL MEASURES)	
				[Vertical lines]	(10.70)		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	
			139.28	[Vertical lines]	15.00			

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS		
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns			
							0	15	WATER	100	All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.		
All dimensions in metres Scale 1:93.75							Client		Countryside Partnerships			Method/ Plant Used	Rotary

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The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
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Legend

-  **Surveyed Bell Pit Positions as identified on site**
-  **Geophysics data - Linear Trend (Archaeology)**
-  **Geophysics data - Linear Trend (Possible Archaeology)**
-  **Geophysics data - Archaeological trench position**

rev.	date	amendments	drawn	chckd

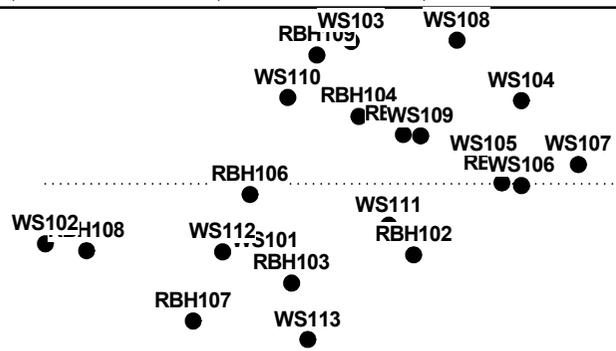
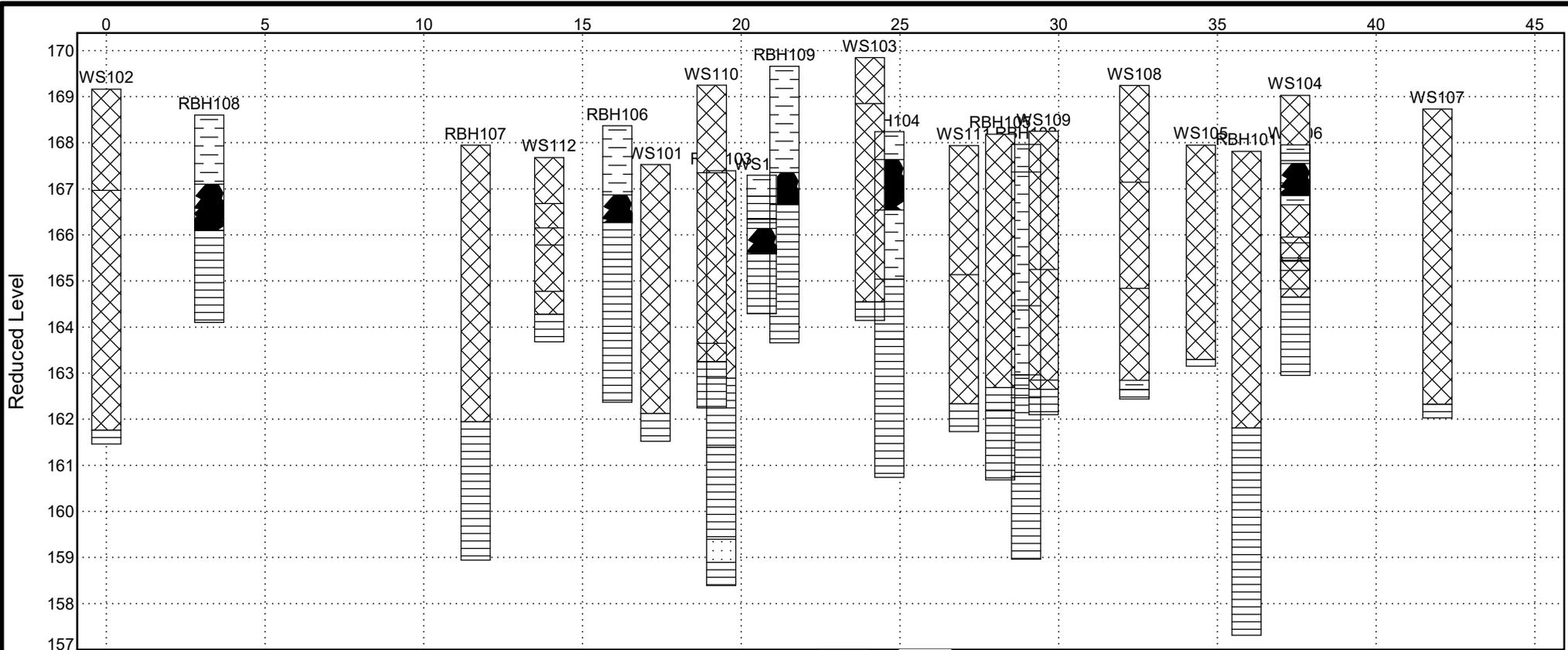
Client: **COUNTRYSIDE PARTNERSHIPS / VISTRY GROUP (WEST YORKSHIRE)**

Project Title:
 Land at Blue Hills
 Whitehall Road West, Birkenshaw
 Bradford, Kirklees, BD11 2DU

Drawing Title:
 Historic Mining Features
 Showing Geophysics Overlay

Scale at A3: 1:250 @ A3	Date: 14.03.24	Drawn by: P.D	Approved by: J.P.D
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Job Ref: 24-054	Drg no: -	Rev: -
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SUBSURFACE SECTION

Client: Countryside Partnerships
Project: Land at Blue Hills Farm, Birkenshaw
Number: 24-054



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS101	
Job No 24-054	Date 05-03-24	Ground Level (m) 167.52	Co-Ordinates () E 419,967.2 N 427,843.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail			Main
			1 ↓	2 ↓	(5.40)			Firm locally soft grey and orangish brown clayey mudstone with pockets of greyish brown clay (MADE GROUND)		
			162.12	5.40				Light grey highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		
			161.52	6.00						

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					0.5 3.9	0.3					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS102	
Job No 24-054	Date 05-03-24	Ground Level (m) 169.16	Co-Ordinates () E 419,950.3 N 427,847.8		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			
						Discontinuities			Main
			 166.96		(2.20)		Firm locally soft grey and orangish brown clayey mudstone (MADE GROUND)		
					(5.20)		Firm brown mottled orangish brown clay (MADE GROUND)		
			161.76		7.40				
			161.46		7.70		Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1.6	1.87					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS103	
Job No 24-054	Date 05-03-24	Ground Level (m) 169.85	Co-Ordinates () E 419,976.6 N 427,859.4		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						Discontinuities	Detail	Main
			168.85	[Cross-hatched pattern]	(1.00) 1.00			Firm brown mottled orangish brown clay (MADE GROUND)
				[Cross-hatched pattern]	(4.30)			Soft locally firm brown and grey gravelly clay with fragments of mudstone and coal (MADE GROUND)
			164.55	[Cross-hatched pattern]	5.30			
			164.15	[Horizontal lines pattern]	5.70			Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1.8	2.15					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS104	
Job No 24-054	Date 05-03-24	Ground Level (m) 169.03	Co-Ordinates () E 419,989.1 N 427,852.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						Discontinuities	Detail	Main
			↓ 167.13	[Cross-hatch pattern]	(1.90) 1.90			Firm locally soft grey and orangish brown clayey mudstone (MADE GROUND)
			165.83	[Cross-hatch pattern]	(1.30) 3.20			Soft locally firm brown and grey gravelly clay with frgments of mudstone and coal (MADE GROUND)
			165.43	[Solid black]	3.60			Black shaley COAL (PENNINE LOWER COAL MEASURES)
			165.23	[Horizontal lines]	3.80			Soft grey and orangish brown silty CLAY with some mudstone and coal fragments (seatearth) (PENNINE LOWER COAL MEASURES)
			164.83	[Horizontal lines]	4.20			Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1.6						No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS105	
Job No 24-054	Date 05-03-24	Ground Level (m) 167.95	Co-Ordinates () E 419,985.3 N 427,848.2		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail			Main
			 		(4.65)			Firm locally stiff brown and grey gravelly clay with pockets of mudstone and coal fragments (MADE GROUND)		
			163.30 163.15		4.65 4.80			Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1.7	3.78					No ground gas recorded.
All dimensions in metres Scale 1:93.75			Client	Countryside Partnerships			Method/ Plant Used	Windowless Sampling			Logged By SW

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS106	
Job No 24-054	Date 05-03-24	Ground Level (m) 167.95	Co-Ordinates () E 419,988.0 N 427,846.1		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						Discontinuities	Detail	Main
			167.78		0.18			
			167.55		0.40			
			166.85		1.10			
			166.65		1.30			
			165.95		2.00			
			165.50		2.45			
			165.45		2.50			
			164.65		3.30			
					(1.70)			
			162.95		5.00			

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					2.3	2.23					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS108	
Job No 24-054	Date 06-03-24	Ground Level (m) 169.24	Co-Ordinates () E 419,984.9 N 427,858.1		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			1 ▽	1 ▽	(2.10)				
			167.14	2.10	(2.30)				
			164.84	4.40	(2.00)				
			162.84	6.40					
			162.64	6.60					
			162.44	6.80					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					2.1	1.10					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS109	
Job No 24-054	Date 06-03-24	Ground Level (m) 168.25	Co-Ordinates () E 419,980.8 N 427,851.2		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		Geology	Instrument/ Backfill
						Discontinuities	Main		
			 165.25	 (3.00)	(3.00)		Firm locally soft light grey clayey mudstone with pockets of coal and burnt shale fragments (MADE GROUND)		
			162.25	(2.40)	(2.40)		Firm locally soft grey and brown gravelly clay with some burnt shale fragments (MADE GROUND)		
			162.85	5.40	5.40				
			162.65	5.60	5.60				
			162.10	6.15	6.15		Stiff grey and orangish brown clay with some mudstone and shaley coal fragments (MADE GROUND) Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1	0.95					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS110	
Job No 24-054	Date 06-03-24	Ground Level (m) 169.25	Co-Ordinates () E 419,971.0 N 427,855.9		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			167.35		(1.90)			Firm locally soft grey and orangish brown gravelly clay with some coal and mudstone fragments (MADE GROUND)	
			163.35		(3.70)			Soft locally firm grey and orangish brown gravelly clay (MADE GROUND)	
			163.65		5.60				
			163.25		6.00			Black and grey shaley mudstone and coal fragments (MADE GROUND)	
			162.25		(1.00)			Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)	
			162.25		7.00				

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					3	2.03					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS111	
Job No 24-054	Date 06-03-24	Ground Level (m) 167.93	Co-Ordinates () E 419,977.2 N 427,844.8		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities			Main
			 165.13	 (2.80)	(2.80)		Soft locally firm grey gravelly clay with some burnt shale, coal and mudstone fragments (MADE GROUND)		
				 162.33	(2.80)	(2.80)		Soft locally firm brown and grey gravelly clay with pockets of coal and mudstone fragments (MADE GROUND)	
				 161.73	(2.80)	(2.80)		Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1	1.72					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS112	
Job No 24-054	Date 06-03-24	Ground Level (m) 167.68	Co-Ordinates () E 419,964.0 N 427,844.9		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			
						Discontinuities			Main
			166.68	[Cross-hatch pattern]	(1.00)		Stiff orangish brown mottled grey gravelly clay with burnt shale fragments (MADE GROUND)		
			166.15	[Cross-hatch pattern]	1.53		Dark grey and orangish brown weathered shaley mudstone fragments (MADE GROUND)		
			165.78	[Cross-hatch pattern]	1.90		Black shaley coal fragments (MADE GROUND)		
			164.78	[Cross-hatch pattern]	(1.00)		Soft grey orangish brown clayey mudstone (MADE GROUND)		
			164.28	[Cross-hatch pattern]	2.90		Black shaley coal fragments (MADE GROUND)		
			163.68	[Horizontal lines pattern]	3.40		Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		
					4.00				

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					2.9	0.325					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No WS113	
Job No 24-054	Date 06-03-24	Ground Level (m) 167.29	Co-Ordinates () E 419,969.4 N 427,837.0		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			
						Discontinuities	Main		
			166.84		0.45		Stiff orangish brown mottled grey CLAY with some ironstone nodules (RESIDUAL SOIL) (PENNINE LOWER COAL MEASURES)		
			166.34		0.95				
			166.14		1.15				
			165.59		1.70		Brown and grey highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		
					(1.30)		Dark grey highly weathered shaley MUDSTONE (PENNINE LOWER COAL MEASURES)		
			164.29		3.00		Black shaley COAL (PENNINE LOWER COAL MEASURES)		
							Light grey locally orangish brown highly weathered MUDSTONE (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
					1.7	1.575					No ground gas recorded.

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Windowless Sampling	Logged By SW
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH101	
Job No 24-054	Date 28-02-24	Ground Level (m) 167.81	Co-Ordinates () E 419,986.5 N 427,846.5		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	TCR (SCR) ROD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities			Main
			161.81	(6.00)	6.00		Reworked greyish brown clay with traces of coal (MADE GROUND) (Drillers description)		
			157.31	(4.50)	10.50		Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75							Client Countryside Partnerships		Method/ Plant Used Rotary		

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH102	
Job No 24-054	Date 28-02-24	Ground Level (m) 167.96	Co-Ordinates () E 419,978.7 N 427,842.2		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1	Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
			167.36		0.60			Light brown CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
					(2.90)			Grey CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			164.46		3.50			Brown sandy CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			162.96		5.00			Dark grey shaley MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			162.46		5.50			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
					(1.70)			Light grey MUDSTONE with brown SANDSTONE bands (PENNINE LOWER COAL MEASURES)		
			160.76		7.20					
					(1.80)					
			158.96		9.00					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS		
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns			
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.		
All dimensions in metres Scale 1:93.75							Client		Countryside Partnerships			Method/ Plant Used	Rotary

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH103	
Job No 24-054	Date 28-02-24	Ground Level (m) 167.39	Co-Ordinates () E 419,968.9 N 427,841.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
			162.89	[Cross-hatch pattern]	(4.50)			Reworked greyish brown clay with traces of coal (MADE GROUND) (Drillers description)		
			161.39	[Horizontal lines pattern]	(1.50)			Light grey weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			159.39	[Horizontal lines pattern]	(2.00)			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			158.89	[Dotted pattern]	(8.50)			Brown SANDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			158.39	[Horizontal lines pattern]	(9.00)			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS			
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns				
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.			
All dimensions in metres Scale 1:93.75							Client		Countryside Partnerships			Method/ Plant Used	Rotary	Logged By

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH104	
Job No 24-054	Date 28-02-24	Ground Level (m) 168.24	Co-Ordinates () E 419,976.3 N 427,853.5		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
			167.64		0.60			Grey CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			166.54		(1.10) 1.70			Black COAL (Drillers description) (PENNINE LOWER COAL MEASURES)		
					(1.50)			Grey CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			165.04		3.20			Light grey weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			163.74		(1.30) 4.50			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
					(3.00)					
			160.74		7.50					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75		Client	Countryside Partnerships			Method/ Plant Used	Rotary			Logged By DT	

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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH105	
Job No 24-054	Date 28-02-24	Ground Level (m) 168.19	Co-Ordinates () E 419,979.5 N 427,851.6		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
				[Cross-hatch pattern]	(5.50)					
			162.69		5.50					
			162.19	[Horizontal lines]	6.00					
				[Horizontal lines]	(1.50)					
			160.69	[Horizontal lines]	7.50					

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH106	
Job No 24-054	Date 29-02-24	Ground Level (m) 168.37	Co-Ordinates () E 419,966.8 N 427,848.9		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
				(1.50)	1.50			Brown and grey CLAY (RESIDUAL SOIL) (Drillers description) (PENNINE LOWER COAL MEASURES)		
			166.87	█	2.10			Black COAL (Drillers description) (PENNINE LOWER COAL MEASURES)		
			166.27	█	2.90			Light grey highly weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			165.47	▨	4.50			Light grey weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			163.87	▨	6.00			Light grey MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		
			162.37	▨						

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH107	
Job No 24-054	Date 29-02-24	Ground Level (m) 167.95	Co-Ordinates () E 419,960.8 N 427,839.9		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					of 1		
Depth	TCR (SCR) ROD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
			161.95		(6.00)			Reworked brown clay and grey with traces of coal (MADE GROUND) (Drillers description)		
			158.95		(3.00)			Light grey weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75		Client	Countryside Partnerships		Method/ Plant Used	Rotary			Logged By DT		

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH108	
Job No 24-054	Date 29-02-24	Ground Level (m) 168.60	Co-Ordinates () E 419,953.4 N 427,846.7		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA					Geology	Instrument/ Backfill
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						Discontinuities	Detail	Main	
			167.10		(1.50) 1.50			Brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))	
			166.10		(1.00) 2.50			Black COAL (Drillers description) (PENNINE LOWER COAL MEASURES)	
			164.10		(2.00) 4.50			Light grey highly weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)	

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	
											All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
All dimensions in metres Scale 1:93.75		Client	Countryside Partnerships			Method/ Plant Used	Rotary			Logged By DT	

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24



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DRILLHOLE LOG

Project Land at Blue Hills Farm, Birkenshaw				DRILLHOLE No RBH109	
Job No 24-054	Date 29-02-24	Ground Level (m) 169.66	Co-Ordinates () E 419,973.8 N 427,858.8		
Contractor Arc Environmental Limited				Sheet 1	

RUN DETAILS			STRATA				of 1		
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thickness)	DESCRIPTION		Geology	Instrument/ Backfill
						Discontinuities	Main		
			167.36	(2.30)	2.30		Brown CLAY (RESIDUAL SOIL) (Drillers description (PENNINE LOWER COAL MEASURES))		
			166.66	(3.00)	3.00		Black shaley COAL (Drillers description) (PENNINE LOWER COAL MEASURES)		
			163.66	(3.00)	6.00		Light grey highly weathered MUDSTONE (Drillers description) (PENNINE LOWER COAL MEASURES)		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS All descriptions based on drillers interpretations of cuttings brought to surface and drilling rates maintained. No ground gas recorded.
Date	Time	Depth	Casing	Core Dia mm	Strike	Water Standing	From	To	Type	Returns	

AGS3 UK DH LOGS.GPJ AGS3_ALL.GDT 3/14/24

All dimensions in metres Scale 1:93.75	Client Countryside Partnerships	Method/ Plant Used Rotary	Logged By DT
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Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 01
Dates: 04/11/2020	Client: Mr. C. Ives		Sheet 3 of 3
Rotary Borehole Log	Location: 419959.40E 427822.88N	Ground level: 167.52mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH				Hard, grey MUDSTONE with sandstone.			
				137.52	30.00	End of Borehole at 30.00m			

Flush Details				Borehole Diameter		Boring Progress			Remarks:	
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)
				Casing Diameter		Water Strikes			Monitoring Installations	
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)
						Remarks			Top (m)	Base (m)
									Pipe Type	Dia (mm)
Checked by:		TD	IFARC							
Log status:		DRAFT	v01.01							



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 02
Dates: 06/11/2020	Client: Mr. C. Ives		Sheet 1 of 3
Rotary Borehole Log	Location: 419990.77E 427769.96N	Ground level: 160.29mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
			0.10m - D2 0.10m - ES1		(0.40)	MADE GROUND: Grass over, soft brown, slightly sandy, slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded, fine and medium including coal, mudstone and brick. (Topsoil).			
			0.50m - D4 0.50m - ES3	159.89	0.40	MADE GROUND: Soft, dark grey, friable, slightly sandy, very gravelly CLAY with low cobble content. Gravel is angular to subangular, fine to coarse including carbonaceous mudstone and coal. Cobbles are angular to subangular, up to 100mm of carbonaceous mudstone.			
			0.60m - B5 0.90m - D7 0.90m - ES6	159.49	0.80				
					(3.70)				
				155.79	4.50	Grey MUDSTONE with sandstone			
					(2.50)				
				153.29	7.00	Dark grey carbonaceous MUDSTONE with coal fragments and sandstone.			
				152.79	7.50	Grey MUDSTONE with sandstone and coal.			
					(4.50)				
Continued next sheet									

Flush Details				Borehole Diameter		Boring Progress				Remarks: Hand excavated pit from ground level to 1.20m. Descriptions based on flush returns from open hole drilling. Borehole backfilled with bentonite.					
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)		Water (m)				
0.00	30.00	Water				06/11	16:00	30.00	15.00						
				Casing Diameter		Water Strikes				Monitoring Installations					
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC													
Log status:	DRAFT	v01.01													



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 02
Dates: 06/11/2020	Client: Mr. C. Ives		Sheet 2 of 3
Rotary Borehole Log	Location: 419990.77E 427769.96N	Ground level: 160.29mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH		148.29	12.00	Grey MUDSTONE with sandstone and coal.		11	
					(5.00)	Orangish brown SANDSTONE with occasional coal flecks.		12	
				143.29	17.00	Brown SANDSTONE with mudstone bands.		13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	

Continued next sheet

<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Flush Details</th> <th colspan="2">Borehole Diameter</th> <th colspan="3">Boring Progress</th> <th rowspan="2">Remarks:</th> </tr> <tr> <th>Top (m)</th> <th>Base (m)</th> <th>Flush Type</th> <th>Flush Return %</th> <th>Depth (m)</th> <th>Dia (mm)</th> <th>Date</th> <th>Time</th> <th>Depth (m)</th> <th>Cased (m)</th> <th>Water (m)</th> </tr> <tr> <td></td> </tr> </table>				Flush Details		Borehole Diameter		Boring Progress			Remarks:	Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)															
Flush Details		Borehole Diameter		Boring Progress			Remarks:																														
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date		Time	Depth (m)	Cased (m)	Water (m)																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Casing Diameter</th> <th colspan="4">Water Strikes</th> <th colspan="4">Monitoring Installations</th> </tr> <tr> <th>Depth (m)</th> <th>Dia (mm)</th> <th>Strike (m)</th> <th>Cased (m)</th> <th>Sealed (m)</th> <th>Time (mins)</th> <th>Rose to (m)</th> <th>Remarks</th> <th>Top (m)</th> <th>Base (m)</th> <th>Pipe Type</th> <th>Dia (mm)</th> </tr> <tr> <td></td> </tr> </table>				Casing Diameter		Water Strikes				Monitoring Installations				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)												
Casing Diameter		Water Strikes				Monitoring Installations																															
Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)																										
Checked by:	TD	IFA RC																																			
Log status:	DRAFT	v01.01																																			



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 02
Dates: 06/11/2020	Client: Mr. C. Ives		Sheet 3 of 3
Rotary Borehole Log	Location: 419990.77E 427769.96N	Ground level: 160.29mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH			(13.00)	Brown SANDSTONE with mudstone bands.			
				130.29	30.00	End of Borehole at 30.00m			

Flush Details		Borehole Diameter		Boring Progress			Remarks:								
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date		Time	Depth (m)	Cased (m)	Water (m)				
				Casing Diameter		Water Strikes			Monitoring Installations						
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC													
Log status:	DRAFT	v01.01													



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 03
Dates: 05/11/2020	Client: Mr. C. Ives		Sheet 2 of 3
Rotary Borehole Log	Location: 419970.41E 427797.57N	Ground level: 163.49mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH			(24.00)	Hard, grey, MUDSTONE with sandstone.			
Continued next sheet									

Flush Details		Borehole Diameter		Boring Progress			Remarks:								
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date		Time	Depth (m)	Cased (m)	Water (m)				
				Casing Diameter		Water Strikes			Monitoring Installations						
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:		TD	IFA RC												
Log status:		DRAFT	v01.01												



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 03
Dates: 05/11/2020	Client: Mr. C. Ives		Sheet 3 of 3
Rotary Borehole Log	Location: 419970.41E 427797.57N	Ground level: 163.49mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH				Hard, grey, MUDSTONE with sandstone.			
				133.49	30.00	End of Borehole at 30.00m			

Flush Details		Borehole Diameter		Boring Progress			Remarks:								
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date		Time	Depth (m)	Cased (m)	Water (m)				
				Casing Diameter		Water Strikes			Monitoring Installations						
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC													
Log status:	DRAFT	v01.01													



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 04
Dates: 09/11/2020	Client: Mr. C. Ives		Sheet 1 of 3
Rotary Borehole Log	Location: 419987.54E 427744.19N	Ground level: 158.21mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
			0.10m - D2 0.10m - ES1	157.81	(0.40)	MADE GROUND: Grass over, soft dark brown, slightly sandy, slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded, fine and medium including coal mudstone and brick. (Topsoil). Firm, brown, mottled orange and grey, slightly sandy, slightly gravelly CLAY. Gravel is subangular to subrounded, fine and medium including coal and mudstone.			
			0.50m - D4 0.50m - ES3		0.40				
		OH		153.71	4.50	Grey MUDSTONE with fragments of coal.			
					(4.10)				
					(7.30)				

Continued next sheet

Flush Details				Borehole Diameter		Boring Progress				Remarks: Hand excavated pit from ground level to 1.20m. Descriptions based on flush returns from open hole drilling.					
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)		Water (m)				
0.00	30.00	Water				09/11	16:00	30.00	20.00						
				Casing Diameter		Water Strikes				Monitoring Installations					
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC													
Log status:	DRAFT	v01.01													



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 04
Dates: 09/11/2020	Client: Mr. C. Ives		Sheet 3 of 3
Rotary Borehole Log	Location: 419987.54E 427744.19N	Ground level: 158.21mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH			(18.20)	Brown SANDSTONE and MUDSTONE with fragments of coal.			
				128.21	30.00	End of Borehole at 30.00m			

Flush Details				Borehole Diameter		Boring Progress			Remarks:	
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)	Water (m)
				Casing Diameter		Water Strikes			Monitoring Installations	
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)
						Remarks			Top (m)	Base (m)
									Pipe Type	Dia (mm)
Checked by:		TD	IFA RC							
Log status:		DRAFT	v01.01							



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 05
Dates: 13/11/2020	Client: Mr. C. Ives		Sheet 2 of 3
Rotary Borehole Log	Location: 419910.93E 427826.83N	Ground level: 166.62mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH			(24.50)	Grey MUDSTONE with orange sandstone and occasional coal fragments.			
Continued next sheet									

Flush Details		Borehole Diameter		Boring Progress			Remarks:								
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date		Time	Depth (m)	Cased (m)	Water (m)				
				Casing Diameter		Water Strikes			Monitoring Installations						
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:		TD	IFA RC												
Log status:		DRAFT	v01.01												



Plant used: Mazenza M13	Project: Blue Hills Farm	Location ID: RO 06
Dates: 12/11/2020	Client: Mr. C. Ives	Sheet 1 of 3
Location: 420023.56E 427784.73N	Ground level: 161.14mOD	Logged by: JS
	Vertical scale: 1:50	Project ID: 2230244

Rotary Borehole Log

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
			0.10m - B3 0.10m - ES1 0.40m - D4 0.40m - ES3	160.84	(0.30) 0.30	MADE GROUND: Soft dark brown, slightly sandy, slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded, fine to coarse of mudstone and coal. (Topsoil)			
					(0.95)	Soft, blueish grey, slightly sandy, slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded, fine to coarse of mudstone and coal. Cobbles are angular to subangular, up to 120mm of mudstone.		1	
				159.89	1.25	Soft, orange mottled grey and brownish, slightly sandy, slightly gravelly, fine to coarse of mudstone and coal.		2	
					(1.25)				
				158.64	2.50	Brown CLAY with gravel of mudstone and coal.		3	
					(2.50)			4	
		OH		156.14	5.00	Grey MUDSTONE.		5	
					(8.00)			6	
								7	
								8	
								9	
								10	

Continued next sheet

Flush Details				Borehole Diameter		Boring Progress				Remarks: Hand excavated pit from ground level to 1.20m. Descriptions based on flush returns from open hole drilling. Borehole backfilled with bentonite.					
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)		Water (m)				
0.00	30.00	Water				12/11	16:00	1.20							
						13/11	16:00	30.00	12.00						
				Casing Diameter		Water Strikes				Monitoring Installations					
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC													
Log status:	DRAFT	v01.01													



Plant used: Mazenza M13	Project: Blue Hills Farm		Location ID: RO 06
Dates: 12/11/2020	Client: Mr. C. Ives		Sheet 3 of 3
Rotary Borehole Log	Location: 420023.56E 427784.73N	Ground level: 161.14mOD	Logged by: JS
		Vertical scale: 1:50	Project ID: 2230244

Coring, Samples & In Situ Testing			Strata Details				Groundwater		
Depth	TCR/SCR/ROD	FI	Samples & Test Result	Level (mOD)	Depth (m) (Thickness)	Strata Description	Legend	Water Strike	Backfill/Installation
		OH		131.14	30.00	Brown SANDSTONE with mudstone and coal fragments.			
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
						End of Borehole at 30.00m		30	

Flush Details				Borehole Diameter		Boring Progress				Remarks:	
Top (m)	Base (m)	Flush Type	Flush Return %	Depth (m)	Dia (mm)	Date	Time	Depth (m)	Cased (m)		Water (m)
				Casing Diameter		Water Strikes					
				Depth (m)	Dia (mm)	Strike (m)	Cased (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
								Monitoring Installations			
								Top (m)	Base (m)	Pipe Type	Dia (mm)
Checked by:	TD	IFA RC									
Log status:	DRAFT	v01.01									